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[INTEGRATING COST BENEFIT ANALYSIS (CBA) INDICATORS WITH THE M & E FRAMEWORK]

USAID/GEORGIA RESTORING EFFICIENCY TO
AGRICULTURAL PRODUCTION



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USAID/GEORGIA RESTORING EFFICIENCY TO
AGRI CULTURE PRODUCTION

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Introduction

Within the framework of the USAID REAP (Restoring Efficiency to Agriculture Production), CNFA has to include the development and maintenance of cost-benefit analyses (CBA) as a regular analytical instrument to track the progress of program activities, including grantees in order to provide support for informed judgment and decision making.

The USAID REAP implemented by CNFA aims at increasing incomes and employment in rural areas by delivering firm-level investment and technical assistance to agribusiness enterprises that provide inputs, services, training and commercial markets to smallholders.

REAP will catalyze increased private investment and commercial finance to the sector, mitigate risk for rural SMEs and entrepreneurs, and expand commercially sustainable linkages between service providers, producers, post-harvest enterprises and local consulting firms. By delivering 120 matching grants worth \$6 million, REAP will also provide technical assistance to at least 700 grantee and non-grantee enterprises, impacting at least 150,000 individuals, including 37,500 women. SMEs assisted by REAP will generate at least 750 new rural jobs, \$15 million in sales of inputs and services to 135,000 smallholders, and new cash markets worth \$10 million for 2,500 producers.

To measure and improve performance, CBA should provide evidence based project by project targets, where these targets can be incorporated into REAP's Performance Monitoring Plan (PMP) to guide project implementation.

Objective of this report

The main objective of this report is to assess the most appropriate means for integrating and synchronizing CBA indicators into the overall REAP implementation and the project's monitoring and evaluation system.

The key concept in CBA involves the monetization of the inputs, outputs, outcomes and impacts over the life of the REAP project. In the REAP Program, we have to monetize the value of the jobs that are created by the project, and the increase in the incomes of the grantees and beneficiaries.

This report examines how the concepts of CBA can be used to develop indicators that can be integrated into the M & E framework for REAP. It describes usable methodologies for collecting and analyzing the data required to implement the CBA indicators. The information from the CBA indicators is part of the risk analysis, which in turn can provide guidance for the design and management of strategies for minimizing the risks of the projects.

As discussed below, the standard application of the CBA methodology has to be modified to take into account the special characteristics of the REAP Program.

Outline of the report

The outline of the report is as follows.

In Section One, we briefly review the relevance of CBA indicators, and why it is important to integrate CBA indicators into the M & E framework.

In Section Two, we discuss some of the special features of the REAP Program.

Based on the above, in Section Three, we suggest a recommended protocol for the REAP Program.

In Appendix A, we discuss some guidelines for financial analysis. We have put this in the Appendix because some of the issues are technical. In addition, there is an accompanying EXCEL template for the financial analysis that illustrates

these ideas more clearly. For learning purposes, the template has been used with REAP members to analyze two primary processing projects.

In Section Four, we discuss risk analysis, and in Section Five, we discuss economic analysis.

In Section Six, we discuss the training needs and capacity building that would be required to implement integration of the CBA indicators in the REAP Program. Finally, in Section Seven, we provide some recommendations.

Section One: relevance of CBA indicators and integration into the M & E framework

The applied CBA methodology is useful for assessing whether an investment project (or program) creates wealth or destroys wealth over its economic life.

With the integration of the CBA indicators into the M & E framework, we monetize the social and economic impacts of the REAP projects. We can assess the extent to which we are achieving the objectives of REAP, and tracking the success of the grantees in monetary terms.

As mentioned earlier, in terms of performance monitoring, it is very important to integrate the CBA indicators into the M & E framework. This improves decision making and facilitates risk management that could enhance the success of the projects.

The mandate states:

Performance monitoring: “Monitoring must include the development and maintenance of regular cost-benefit analyses to track the progress of the activity in meeting its expected results, including tracking success of grantees.”

As a point of reference for this report, we use the guidelines for USAID analysts for “Economic Analysis of Feed the Future Investments.” It should be noted that the investment projects under the Feed the Future Initiative are different from the types of projects that are funded by the REAP Program in terms of target groups and beneficiaries, impacts, time horizon, scope, size, type and scale. Some of these issues are discussed in further detail in Appendix A.

The spirit of the guidelines for Feed the Future is very relevant for the REAP Program, and is helpful for thinking about the integration of CBA indicators with the M & E framework.

However, the guidelines may have to be revised to take into account the major differences between the investments for Feed the Future, and the investments in the four focus areas of the REAP Program.

Based on the guidelines for Feed the Future, we develop some guidelines that are appropriate for integrating CBA indicators with the M & E framework for the projects in the REAP Program.

Section Two: characteristics of REAP Projects

Ideally, from a conceptual point of view, the unit of analysis for the CBA should be the individual grant application (or project), and the analysis should be aggregated to higher levels, such as the types of grantees or types of programs. However, for the following inter-related reasons, it seems not reasonable or practical to conduct a CBA for each grant application, as envisioned in the Guidelines for Feed the Future.

- Number of grantees (applications)
- Size of grants
- Timely availability and reliability of relevant information
- Time and human resources

We briefly comment on each of the above reasons. Based on this, we provide a suggested protocol for the REAP program in the next section.

Number of grantees

In the REAP Program, the number of grantees is relatively large (in the 100's), and the application of CBA for each grant application will require additional resources in time and staff. Given the large number, it may not be realistic and worthwhile to analyze each grantee and derive CBA indicators. Later in the report, we discuss the issue of training for the staff.

Size of the grants

The grants are in various sizes and will differ across the four focus areas. The four focus areas are:

- ✓ Primary producers
- ✓ FSC (Farm Service Centers) and MSC (Machinery Service Centers)
- ✓ Post-harvest and processing facilities
- ✓ Information and support service providers

Based on both the number of grantees and the sizes of the grants, it may be appropriate to establish a threshold value for the application of CBA indicators. For example, only “large” grants will require an application of CBA. For “small” grants, the contribution of the CBA to the effectiveness of performance monitoring may not be sufficiently high to justify the additional resources. The selection of the appropriate value for the CBA threshold is open to discussion among the members of the REAP Team. The threshold value should take into account the value (size) of the projects, the number of projects, and the availability of resources in terms of staff and time.

Timely availability and reliability of relevant information

In addition to the above two issues, the application of CBA will require additional information from the grantees, and the collection of additional data by the analysts and reviewers at REAP. The quality of the CBA will depend on timely availability and reliability of the relevant information. This would increase the processing time for the grant applications.

Time and human resources

Applying simple CBA to each final grant will require substantial time and human resources. In the next section, we suggest a protocol for applying the CBA methodology to selected projects, taking into account the issues that have been discussed here.

Section Three: recommended protocol

Based on the issues and consideration in the previous section, we recommend the following protocol for integrating CBA indicators with the M & E framework.

In each round of selection, over the time horizon of the REAP Program, REAP will select representative projects in each of the four focus areas. It should be noted that in each round, there may not be projects in all of the focus areas. Over the life of the REAP Program, we will have CBA indicators for a sufficient number of projects that are representative of the four focus areas.

First stage, preliminary selection

For the first (preliminary) stage of the selection of the grantees, there would be no application of CBA. The current procedure is satisfactory for the first stage in the selection process. The use of CBA at this stage will not contribute substantively to the effectiveness of the screening process since the CBA would be only one input in the overall multi-criteria protocol for approving grant applications.

For example, suppose there are 40 grant applications, and in the first stage, only 15 grantees receive preliminary approvals. Then these 15 projects that have passed the first stage will be eligible for final approval by USAID.

Second stage, final approval by USAID

In the second stage, suppose only 10 projects, out of the 15, are approved by USAID. Then from the 10 projects, one or two representative projects in each of the four focus areas will be selected for CBA application and the CBA indicators from these projects will be integrated with the M & E framework.

Representative selection

It is important to understand the social and economic impacts, cash flow profile, risk profile and dynamics of the projects in each of the four focus areas, and thus, it would be necessary to conduct the representative CBA analysis for each of the areas.

It may not make sense to randomly select projects from the set of all final projects approved by USAID because we need projects from each of the focus areas. Also, it might be better to select representative samples (stratified) from the final approved projects in each of the focus areas rather than random samples, due to the small number of projects.

Over the life of the REAP Program, the CBA indicators from the representative projects in the four focus areas will provide valuable information on the monetary values of the jobs and incomes that are being generated by the projects. Based on these representative projects, we can cautiously extrapolate the monetized impacts to the other projects that share similar characteristics.

Section Four: risk analysis

In this section, we briefly discuss risk analysis. The risk analysis in the final project proposal will describe qualitatively the key variables (indicators) that will be critical over the life of the project. The risk analysis will review the recent trends of these indicators over the past five years, and as part of the analysis, we discuss the risk situation with the managers and grantees of the projects. For example, it would be important to understand the trends in the prices of inputs and outputs, and how these changes would impact the project.

It is important to identify and think through the impacts of the risk variables in the early stages of the projects. Based on the risk analysis, we can design appropriate risk management strategies for mitigating the risks and increasing the probability of success for the project. It would be helpful to conduct simple sensitivity analyses with some of the variables. However, since this may not be possible, the risk analysis may be largely qualitative.

Integrating the risk variables with the M & E framework

Over the life of the REAP Program, the indicators from the risk analysis will be integrated with the guidelines for the M & E framework. It should be noted that the analytic time horizon for the projects that are funded by the REAP Program may be much longer than the life of the project for the purposes of M & E within the REAP Program. This means that the success of the grantees will only be monitored within the time horizon of the REAP Program. It is expected that the projects of the grantees will be successful and sustainable beyond the time horizon for monitoring. However, in the REAP Program; these subsequent years will not be monitored.

Tracking success of grantees

The appropriate time horizon for tracking the success of the grantees should be the analytic time horizon for the project, which is longer than the time horizon for the M & E framework. This is simply a structural issue which we may be unable to resolve unless changes are made to the M & E framework

Section Five: economic analysis

Based on the indicators, we will calculate the monetary values of the social and economic impacts that are attributable to the project, including any negative or positive externalities, in accordance with the guidance for the M & E framework. For example, the impact on the environment could be positive or negative. To the extent possible, we

should monetize the impacts of the externalities with the information that will be obtained from the surveys of the beneficiaries. We have to monetize the positive and negative externalities, if any, that are directly attributable to the project. For the projects in REAP, externalities may not be an issue.

However, some of this information may not be easy to obtain, may not be reliable, and be difficult to monetize.

In the economic analysis, for each of the line items in the financial analysis, we estimate the corresponding economic values by identifying the relevant market distortions, such as taxes and subsidies. In many of the small agricultural projects, there may be no taxes on the inputs or the outputs. However, for service centers and processing units, taxes may be relevant.

Also, in cases where there is information, we may have to estimate the value of the subsidized financing that is provided to the small and medium enterprises.

Impact on government revenues

The project may have an impact on government revenues through taxes and subsidies. Based on the final report of the project, over the life of the project, we will monitor the impacts, if any, on government revenues. For example, we would need to assess the impact of subsidized government financing on loans to the small and medium enterprises.

Unintended impacts

If appropriate, we should also describe any unintended impacts that may be attributable to the project.

Income generation

In alignment with the goals and objectives of the REAP Program, we will estimate the income generation for the beneficiaries across different types of jobs, and gender. For example, we will calculate the number of jobs (and full-time equivalents) created across different categories, such as professional, skilled, semi-skilled, unskilled and seasonal, taking into account relevant characteristics, such as gender, region and socioeconomic status (SES) of the beneficiaries. In addition, we will estimate the annual income for each of these jobs in terms of full-time equivalents.

TWO M & E indicators

Below, we briefly discuss two M & E indicators that are important for the economic analysis.

SPS location: Program Area 4.5: Agriculture

Initiative affiliation: FTF – IR4: Increased employment opportunities in targeted value chains

Indicator title: 4.5-2 Number of jobs attributed to the project

The number of jobs attributed to the project is one of the M & E indicators. This indicator is in the M & E framework. Below, we briefly comment on this indicator.

Many of the agricultural jobs in the primary processing sector consist of seasonal work throughout the year, and the total number of working days in a year for an individual may be less than 30 days, which is the cut-off point for a job. Thus these seasonal jobs will not be counted as jobs, even though they are attributable to the project. The wages that they earn in these seasonal jobs may be quite substantial and critical to family survival. One way to capture the benefits of these seasonal jobs would be to calculate the total annual wages of all the seasonal workers and divide by the average annual wage for such workers in that region of the country. This number would measure the number of jobs that we are creating, in terms of the average annual wage for a typical worker. Below, we name this the Full Time Income Equivalent (FTIE) job.

The indicators for jobs and income would be for men and women in different categories: skilled (professional), semi-skilled and unskilled. The annual incomes should be compared with the average incomes in the locations of the projects. This would allow us to assess the value of the income generation relative to the location of the project.

The indicators are:

- ✓ Number of full-time jobs for men and women, with annual incomes for each type of job
- ✓ Number of full-time equivalent (FTE) jobs, with annual incomes for each type of job
- ✓ Number of full-time income equivalent (FTIE) jobs, with annual incomes for each type of job

For some projects, there is employment of cooperative members without salaries. They only receive dividends.

How do we count these jobs? Are they attributable to the project? How do we value these jobs in the M & E framework? To deal with this situation, we have to list the opportunity costs of these workers, and also track the dividends, and compare the opportunity costs with the dividends that they receive.

SPS location: Program Area 4.5: Agriculture

Initiative affiliation: FTF – IR1: Improved agricultural productivity

Indicator title: 4.5-16, 17, 18: Gross margins and net incomes

To measure productivity and profitability, we calculate the gross margin and the net income. This information will be available from the grantees. However, from the other beneficiaries of the project, it should be recognized that it is not easy to collect such information, especially net income, through surveys. The direct and indirect beneficiaries may not have easy access to such information. They may be reluctant to share such information and even when they share, the information may not be accurate or reliable. This indicator will be added to the survey instruments for the beneficiaries.

Direct and indirect beneficiaries

In the economic analysis, we have to estimate and monetize the social and economic impacts on the direct and indirect beneficiaries, such as the customers and suppliers and other stakeholders who are affected by the project. The beneficiaries will vary across the types of projects. Below, we illustrate ideas for a primary production project.

Customers of the outputs of the projects

The farmers who purchase the seedlings from the project will increase their production of fruits, and increase their net income from the sale of the fruits.

Some of the larger farmers may supply fruits to retailers, and the retailers may also benefit. However, this is a secondary benefit and it may not be easy to collect the information on the monetary benefits.

Farmers who receive training

The grantee will also provide training to the farmers. The survey instrument will interview a sample of the farmers who receive training, and assess the monetary value of the training that they received.

Suppliers of inputs to the projects

The major beneficiaries would be the employees and workers of the project. The benefits to the suppliers of the other inputs to the projects would be small or negligible.

Section Six: Training needs and capacity building

In this Section, we briefly discuss some of the training needs and capacity building that would be required to apply CBA to the projects, and integrate the CBA indicators with the M & E framework.

Capacity building options for the REAP Program

To fulfill the mandate for integrating CBA with the M & E framework, the REAP Program would need to have additional human resources and develop the capacity of the REAP team.

Full-time staff member

The REAP Program would need to hire a full-time staff member to assist the M & E Manager to fulfill the mandate for integrating CBA indicators with the M & E framework.

Center of Excellence in CBA in the REAP Program

In mid-May, there is a 4-week training program on CBA at Duke University. Should USAID wish to deepen its involvement in applying CBA in its programs, attendance of this program by a USAID selected participant might be an option.

Section Seven: Recommendations

Below, we summarize the main points and draw some conclusions. We have reviewed the feasibility of integrating CBA indicators with the M & E framework of the REAP Program. The CBA indicators would provide valuable information on the monetary values of the impacts of the REAP Program. However, the REAP Program has some characteristics that would make it inappropriate to apply CBA across the board to all of its projects. Instead, we recommend a protocol that applies CBA to representative projects, and the CBA indicators for these projects can be integrated into the M & E framework. Based on the analysis for the representative projects, the impacts can be aggregated up to the level of the four focus areas.

Recommendations

We briefly provide some recommendations

1. Selected CBA indicators should be integrated into the M & E framework so that the monetary values of the impacts are recognized.
2. Due to the special features of the REAP Program, the CBA should be applied only to representative projects.
3. The REAP Program needs to hire a full-time person provide support for the integration of the CBA indicators.

APPENDIX A: Guidelines for financial analysis**Financial analysis as a component of the CBA for REAP Projects**

The indicators for the CBA will be based on the financial analysis that is conducted in the final report for the specific project. There is an accompanying EXCEL template for these guidelines.

These general guidelines are relevant for constructing the financial Net Cash Flow (NCF) profiles for typical projects in the four focus areas of the REAP Program. The four focus areas are:

- ✓ Primary producers:
- ✓ FSC (Farm Service Centers) and MSC (Machinery Service Centers)
- ✓ Post-harvest and processing facilities
- ✓ Information and support service providers

The risk, economic and distributive analyses will be based on the financial NCF profile.

All of these guidelines will not apply to all the projects. These guidelines should facilitate the judicious application of CBA, taking into account the specific characteristics of the projects in each of the focus areas.

As part of the application process, the grantee has to submit financial statements (income statement, balance sheet and cash flow statement). The financial NCF profile will be derived from the financial statements. And the economic analysis will be based on the financial analysis.

Analytic time horizon

The analytic time horizon for a project depends on the asset with the longest useful economic life. The analytic time horizon may differ across the projects in four focus areas, and could range from 5 years to 12 years.

Domestic currency and foreign exchange

The domestic currency will be the default currency for the construction of the relevant nominal cash flow statements. If the outputs are exported or the inputs are imported, then the values of the outputs and inputs should be listed in the foreign currency, say U.S. dollars, and converted into the domestic currency at the prevailing exchange rates. With this approach, we can estimate the effects, if any, of the foreign exchange rate on the financial viability (and sustainability) of the project.

Risk of fluctuations in the inflation rates and foreign exchange rates

Over the life of the project, if the expected domestic inflation rates and foreign exchange rates are important risk variables, then relevant sensitivity analyses should be conducted so that strategies for risk mitigation may be designed and developed.

For simplicity, we may assume that the expected domestic and foreign inflation rates are constant over the life of the project. If relevant, the impacts of changes in the real exchange rate can be analyzed in the sensitivity analysis.

If possible, the analysis should avoid multiple foreign currencies because it will increase the complexity. In some cases, such as foreign loans in multiple currencies, it may be unavoidable.

Information prices and quantities of outputs and inputs

Recent information (over the past five years) for prices and quantities of outputs and inputs should be collected, and based on this, the future profiles of the prices and quantities should be projected.

Land

Any investments in land or the use of existing land should be listed separately.

Investment and reinvestment costs, excluding land

The investment schedule for the project should list the investments (and reinvestments), excluding land, that will be required during the life of the project. Any reinvestments during the life of the project should take into account any **real** changes, relative to inflation, in the costs.

If possible, we should disaggregate the investment costs into traded and non-traded components. For example, if the project uses imported machinery, then the value of the imported machinery (inclusive of any tariffs) should be listed in the foreign currency, and then converted into the domestic currency with the prevailing exchange rates.

Reinvestment, excluding land

For example, suppose we have to buy a truck for the project in year 0 and in year 5, and the current cost is \$1,000. What would be the cost of the identical truck in year 5? The best way to answer this question is to ask the supplier of the truck. If this is not possible, then we should use historical data to estimate the expected cost in year 5.

Aggregation of investment line items

In some projects, there may be multiple items in the investment schedules for the initial investments and reinvestments during the life of the project. The multiple items should be aggregated into three or four line items. As noted earlier, land should always be listed as a **separate** line item.

Opportunity cost of existing assets

The opportunity costs of any existing assets, such as land, machinery & buildings, should be listed in the investment schedule for the project at the prevailing market values.

Economic and accounting depreciation schedules

The appropriate economic and accounting depreciation schedules should be constructed for new investments, reinvestments during the life of the project, and existing investments.

Liquidation value of land

The liquidation value of land should be the same as the initial value of the land, adjusted only for any increases due to inflation during the life of the project. The assumption is that the activities of the project did not lead any improvement or damage to the land. If the activities of the project lead to changes in the value of the land, then these changes should be taken into account.

Liquidation values of assets

At the end of the project, the value of the land should be listed at the same value that was used at the beginning of the project, assuming that the value of the land was not increased due to any improvements, or decreased, due to any damage.

At the end of the project, some assets, such as machinery, irrigation systems or buildings, may still have some useful economic life, and the liquidation values of these assets should be listed as cash inflows in the last year of the project.

Increases in wages and salaries over the life of the project

The analysis should take into account the expected increases in wages and salaries over the life of the project. For simplicity, we may assume that the average increase is constant over the life of the project.

Family labor

If any family labor is used in the project, then the opportunity cost of the labor should be listed in the financial analysis.

Opportunity cost of the cooperative members who will be compensated with dividends rather than salaries

We have to list the correct opportunity cost of the jobs that the members of the cooperatives will be doing. In the profit and loss statement, these imputed values for direct costs will be included in the COGS, and the imputed values for indirect costs will be added to the general administrative costs.

Calculation of revenues

Many of the projects will have multiple revenue streams. For example, a primary processing project may be selling several types of rootstock at different prices. From a practical point of view, we should aggregate the multiple revenue streams into two or three line items, and use weighted prices to calculate the aggregated revenue streams. With this aggregation, we will be able to perform simple sensitivity analyses as part of the risk analysis for the project.

A farm service center may sell many products, such as fertilizers and pesticides, and services. For simplicity, all of the multiple revenue streams should be aggregated into three or four categories.

Increases in outputs over the life of the project

If there are planned annual increases in the quantities of the outputs over the life of the project, then the annual growth rates should be listed explicitly in the table of parameters. For example, additional machinery may be purchased or additional land may be used in the project and these additional investments may lead to increases in outputs.

The quantities of outputs may change due to various factors. The sensitivity analyses should examine how changes in the quantities of the outputs will affect the project.

Changes in the prices of the outputs over the life of the project

Over the life of the project, the prices of the outputs may change. The sensitivity analysis should examine how changes in the prices of the outputs will affect the project.

Calculation of COGS (Cost of Goods Sold)

The direct costs of production will have multiple items. We should aggregate the multiple items into three or four line items. If possible, we should disaggregate into traded and non-traded goods. Imported items, such as fertilizer or pesticides, should be listed in the foreign currency, and then converted into the domestic currency with the prevailing exchange rates.

Since we are interested in the wages that workers are getting from employment, we should separate the wage items in the calculation of the Cost of Goods Sold (COGS). Thus, we will have the wage component of the COGS, and the non-wage component of the COGS. Over the life of the project, the annual wages are likely to increase.

Changes in the prices of inputs

Over the life of the project, the prices of inputs may increase. We should take into account any expected changes in the price of inputs, and analyze how the changes will affect the project.

Tax liabilities and losses carried forward

Normally, the taxes will be paid. However, if the project qualifies as a cooperative, then there may be tax exemptions for a certain number of years. Losses will be carried forward.

Indirect costs

Indirect costs, such as general administrative, sales and marketing costs, should be listed. Over the life of the project, the indirect costs may increase.

Working capital

Working capital, namely accounts receivable, accounts payable, cash required for operations and inventories, should be taken into account. For simplicity, we assume that there are no inventories for raw materials and finished goods.